

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK

SIMO HOLDINGS INC.,

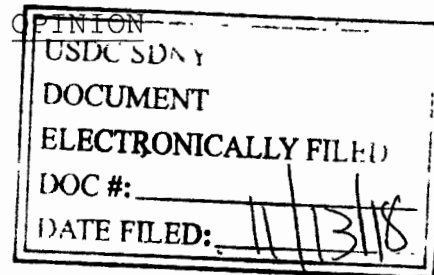
Plaintiff,

-against-

HONG KONG UCLOUDLINK NETWORK
TECHNOLOGY LIMITED and
UCLOUDLINK (AMERICA), LTD.,

Defendants.

18-cv-5427 (JSR)



JED S. RAKOFF, U.S.D.J.

In this patent infringement suit, the parties dispute the meaning of several claim terms. This Court, following briefing and oral argument, previously issued a "bottom-line" Order adopting constructions of the disputed claim terms (and, in one case, declining to construe the term further). See Order dated Nov. 1, 2018, ECF No. 60. This Opinion sets forth the reasons for that Order.

I. Factual Background

SIMO Holdings, Inc. ("SIMO") describes itself as a "provider of software-based mobile connectivity solutions." First Am. Compl. ¶ 3 ("1AC"), ECF No. 20. SIMO holds United States Patents Nos. 8,116,735 ("the '735 Patent") and 9,736,689 ("the '689 Patent"), both of which are titled "System and Method for Mobile Telephone Roaming." 1AC Exh. A ("'735 Patent"), ECF No. 20-1; 1AC Exh. B ("'689 Patent"), ECF No. 20-2. The latter

patent is a continuation of the first. '689 Patent, cover page. Both patents describe a system by which subscribers can use their phones or other mobile devices while traveling abroad.

Mobile telephones and other devices are generally subscribed to a wireless communication network that covers a limited geographic scope. '735 Patent at 1:26-33, 62-66.¹ A device will contain authenticating information, usually stored either on a SIM ("subscriber identity module") card or on the phone itself. Id. at 10:10-29. That authenticating information is what tells the service provider to provide cellular and wireless service to the device. Id. at 10:39-58. When a person attempts to use a mobile device outside of the service provider's geographical area - for example, someone who typically lives in New York using their phone in London - the local network uses the authentication information to identify the device's home network. Id. at 2:1-14. If the local provider and the home provider have an agreement, the device will be allowed to use the local network, but the user will incur "roaming" charges that are often substantial. Id. at 2:24-28.

To avoid roaming charges, travelers can purchase or rent a new SIM card that is subscribed to the local network. Id. at

¹ Although the patents can be used with devices other than mobile phones - for example, laptop computers - for the sake of simplicity the Court will generally describe the operation of the patents as they relate to mobile phones.

2:31-36. Once the new SIM is installed in the phone, that SIM's authentication information can be used to access the local network without roaming fees. However, this can be inconvenient for travelers visiting multiple different countries, each of which might contain different local networks. Id. at 2:36-39. Also, while using the foreign SIM, the user will not be able to receive calls to their original phone number. Id. at 2:39-41.

SIMO's inventions seek to provide an alternative for accessing foreign networks while roaming. SIMO maintains various "banks" of authentication data for a number of countries. Id. at 3:7-10, 9:57-61. Users can purchase a subscription to SIMO's service, and when a subscribed user travels to a different country, the user's phone can "borrow" local authentication data from one of the authentication banks. Id. at 3:6-7, 3:10-17. The phone therefore registers to the local network as a local device and may be used without incurring roaming fees. Id. at 3:17-20.

Defendants Hong Kong uCloudlink Network Technology Limited and its American subsidiary uCloudlink (America) Ltd. (collectively, "uCloudlink") sell WiFi hotspots and mobile phones. SIMO brought this suit, alleging that uCloudlink's products infringe upon the '735 and '689 Patents. Specifically, SIMO claims that at least the "Glocalme G2, G3 and U2 Series WiFi hotspot devices and S1 mobile phones" (the "Accused Products") embody claims 1-4, 8-9, and 12-13 of the '735 Patent

and claims 1, 5-8, 10-14, and 19-20 of the '689 Patent. 1AC ¶¶ 18, 41. According to the complaint, uCloudlink operates "CloudSIM data centers" as well as smaller "Local SIM Banks." 1AC ¶ 43. SIMO claims that the Accused Products operate basically the same way as its own service, i.e., a subscriber who is traveling abroad can access the bank's SIM information in order to connect to the local communication network without paying roaming fees. 1AC ¶¶ 20, 28, 49.

The resolution of that dispute will be determined later in the case. But first the Court was required to resolve the parties' disputes regarding the construction of several terms used in one or both of the patents. See Markman v. Westview Instruments, Inc., 52 F.3d 967, 979 (Fed. Cir. 1995) (en banc), aff'd 517 U.S. 370 (1996) (holding that court is obligated "to construe as a matter of law the meaning of language used in the patent claim"). The Court received briefing from both sides and heard oral argument on October 19, 2018. For the reasons that follow, the Court reached the constructions announced in its earlier bottom-line Order.

II. Discussion

A. Legal Standard

"When the parties raise an actual dispute regarding the proper scope of the[] claims, the court . . . must resolve that dispute." O2 Micro Int'l Ltd. v. Beyond Innovation Tech. Co.,

Ltd., 521 F.3d 1351, 1360 (Fed. Cir. 2008). "[O]nly those terms need be construed that are in controversy, and only to the extent necessary to resolve the controversy." Vivid Tech., Inc. v. Am. Sci. & Eng'g, Inc., 200 F.3d 795, 803 (Fed. Cir. 1999). The purpose of claim construction is "to provide the jury with a clear understanding of the disputed claim scope." Eon Corp. IP Holdings v. Silver Spring Networks, 815 F.3d 1314, 1320 (Fed. Cir. 2016).

The claim terms of a patent "are generally given their ordinary and customary meaning," which is "the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention." Phillips v. AWH Corp., 415 F.3d 1303, 1312-13 (Fed. Cir. 2005) (en banc) (quoting Vitronics Corp. v. Conceptronic, Inc., 90 F.3d 1576, 1582 (Fed. Cir. 1996)). A term that does not "depart from its ordinary meaning" may not require construction. Biotec Biologische Naturverpackungen GmbH & Co. KG v. Biocorp, Inc., 249 F.3d 1341, 1349 (Fed. Cir. 2001) (upholding district court's decision not to construe "melting"). However, a court may not simply rely on the "ordinary" meaning of a term if that ordinary meaning "does not resolve the parties' dispute." O2 Micro, 521 F.3d at 1361 (holding that district court erred by not construing "only if," where parties disputed whether that term permitted exceptions); see also Eon Corp., 815 F.3d at 1319 (holding that district

court erred in failing to construe "portable" and "mobile" to resolve parties' dispute about whether those terms applied to objects that were only theoretically capable of being moved).

The meaning of a claim term must be understood in context; it may be informed by other claims in the patent, by the specification, by the patent's prosecution history, and by extrinsic evidence such as dictionaries. Phillips, 415 F.3d at 1314. The specification, in particular, is usually "the single best guide to the meaning of a disputed term." Id. at 1315 (quoting Vitronics, 90 F.3d at 1582). However, limitations from the specification should not be read into the claims, nor should the claim be limited to specific embodiments described in the patent. Phillips, 415 F.3d at 1323.

B. Disputed Claim Terms

The parties dispute the meaning of several terms appearing in one or both patents. Simplifying the Court's task, the parties agree that each such term has a single meaning across both patents. Accordingly, the Court treats both patents as instructive as to the meaning of terms used in the other.

1. "enabling an initial setting"

This term appears in claims 1 and 2 of the '735 patent and claim 8 of the '689 patent. uCloudlink offers the following construction:

activating a starting configuration for enrolling a wireless communication device in a communication service, which includes: requesting a subscription; establishing a subscriber account; storing the subscriber details; downloading and installing remote authentication module; transmitting credential parameters and location parameters; and then optionally sending an acknowledgement

Def.'s Opening Claim Const. Br. 5 ("uCloudlink Br."), ECF No.

35. SIMO proposes giving the term its "plain and ordinary meaning." Pl.'s Opening Claim Const. Br. 5 ("SIMO Br."), ECF No.

37, arguing, in effect, that the term does not require further construction but is clear on its face. The Court agrees with SIMO.

SIMO claimed in its papers that this term "is commonly used in the field of telecommunications," SIMO Br. 5, but it presented little evidence to back up that assertion. But the primary position taken by SIMO in its papers, and even more clearly at oral argument, was that the term did not have a specialized or technical meaning, and that a person of ordinary skill in the art would understand the words the same way a layperson would. Tr. Oct. 19, 2018 at 24:13-18.

In response, uCloudlink failed to provide the Court with evidence that the term has a specialized meaning that departs from its ordinary meaning to a layperson. uCloudlink's construction, moreover, was plainly deficient. The context in which this term appears in Claim 1 of the '735 patent is

"enabling an initial setting of said foreign wireless communication device for enrolling said foreign wireless communication device in service." '735 Patent at 22:19-21. The first part of uCloudlink's construction tracks this, and SIMO concedes that the phrase "activating a starting configuration" "embraces the common use" of the disputed term. SIMO Br. 5.² However, the Court does not believe that this substitution of synonyms would be helpful to the jury. "Activating a starting configuration" is not simpler or more intuitive than "enabling an initial setting."

The remainder of the first clause of uCloudlink's proposed definition - "for enrolling a wireless communication device in a communication service" - is redundant, as it simply repeats the language that follows "enabling an initial setting" in the claim itself. Substituting the proposed definition into the claim language would yield the following: "[activating a starting configuration for enrolling a wireless communication device in a communication service] of said foreign wireless communication device for enrolling said foreign wireless communication device in service." This redundancy would, at best, only add confusion.

² At oral argument, SIMO suggested that the word "activating" connotes active participation, whereas "enabling" may be more passive. Tr. Oct. 19, 2018 at 22:15-20. But the very dictionary SIMO relies on to define "enable" lists "activate" as a synonym. See Weldon Resp. Decl. Exh. D, ECF No. 47-4. The Court does not see a meaningful difference between the two words.

uCloudlink's proposed construction goes further astray when it lists the purported steps of enabling an initial setting. The steps described in uCloudlink's construction - requesting a subscription, establishing an account, and so on - are all listed in Claim 2 of the '735 patent, which says that it describes "[t]he method of claim 1, wherein the enabling an initial setting step further comprising" the listed items." '735 Patent at 23:12-34 (emphasis added). In other words, Claim 2 is "enabling an initial setting" plus the listed items, which means "enabling an initial setting" must not include the listed items on its own. The language of the claims precludes this portion of uCloudlink's construction. "[T]he presence of a dependent claim that adds a particular limitation raises a presumption that the limitation in question is not found in the independent claim." Liebel-Flarsheim Co. v. Medrad, Inc., 358 F.3d 898, 910 (Fed. Cir. 2004).

uCloudlink argues that Figure 6 of the '735 patent supports its construction, see uCloudlink Br. 5-6, but the Court disagrees. Figure 6 illustrates the process of "Phone Enrolling in service." '735 Patent Fig. 6. It does not purport to define what "enabling an initial setting" means. Indeed, that phrase does not even appear in the specification's description of Figure 6. See '735 Patent at 14:54-1543. In any event, Figure 6's illustration would not overcome the plain language of claim

2, which necessarily means that "enabling an initial setting" can, but need not, include the steps listed.

The Court concludes that uCloudlink has not raised an "actual dispute," O2 Micro, 521 F.3d at 1360, regarding the scope of this claim. uCloudlink has not explained how its construction would result in a different claim scope than the ordinary meaning of the phrase. uCloudlink argues that the jury will not understand what it means to "enable an initial setting," but the Court disagrees, especially given that the jury need not understand the phrase in isolation but only needs to understand what the phrase means in the context of the claims. The claims themselves provide ample context - indeed, they include all the language that uCloudlink would import into the term itself.

Because the Court is confident that the jury will be able to apply the meaning of the term within the context of the claims, and because the parties have not identified any genuine dispute as to the scope of the term, the Court need not construe the term further. See Biotec Biologische, 249 F.3d at 1349.

2. "extension unit"

This term appears in claims 1-4, 8, 9, and 13 of the '735 patent and all asserted claims of the '689 patent. In its papers, SIMO once again asked that the term be given its ordinary meaning. SIMO Br. 8. But here that suggestion is

plainly inadequate; the term is not self-explanatory and SIMO offered no support for its contention that it has a common meaning in the relevant field.

As an alternative, SIMO at oral argument proposed that the term be construed as "a device that is capable of sending and receiving communications." Tr. Oct. 19, 2018 at 35:22-23. That suggestion is not much better. The wireless client - a phone or a laptop, for example - is also a device that is capable of sending and receiving communications. SIMO's construction fails to distinguish the extension unit from the wireless client and is more likely to create confusion than provide clarity.

uCloudlink offers this construction:

a hardware computing device that is capable of communicating wirelessly with both a foreign wireless client and a wireless communication network³

uCloudlink Br. 7. uCloudlink construes the patent to mean that the extension unit kicks in when the mobile phone is incapable of connecting to the wireless network directly; instead, the phone connects to the extension unit, which in turn connects to the network. uCloudlink Br. 8-9. SIMO does not appear to take issue with this general gloss on what the extension unit does;

³ uCloudlink's proposal originally included the language "including a base station" at the end of the construction. See uCloudlink Br. 7. However, at oral argument, counsel for uCloudlink offered to drop that language, Tr. Oct. 19, 2018 at 42:8-9, and the Court agrees that it is not necessary.

however, it argues that uCloudlink has improperly limited the claim term by specifying that the unit must communicate "wirelessly." SIMO Br. 8. The dispute therefore revolves around whether the extension unit may only operate wirelessly or whether it may communicate by wired connection.⁴

SIMO points out that the patents clearly contemplate wired (as well as wireless) connections, as each repeatedly states that "[i]n some embodiments, communications between the extension unit 108 and the [wireless communication] client 106 are via BLUETOOTH wireless connection, while in other embodiments, the communications may occur over a wire coupling the devices." '735 Patent at 17:61-65; see also id. at 18:29-31, 18:63-67; '689 Patent at 19:20-24, 20:22-26, 20:59-60, 21:35-36. In response, uCloudlink notes that claim 1 of the '735 Patent - which all remaining claims of the '735 Patent cross-reference - requires that the extension unit be "wirelessly communicating directly" with the foreign wireless client. '735 Patent at 22:26-28. However, the Court cannot agree with uCloudlink that this acts as a categorical limitation on the term "extension unit." The specification unambiguously states that some embodiments utilize a wired connection. To the extent that the

⁴ The Court notes that uCloudlink's construction, read literally, only requires that the unit be capable of wireless communication, which might not rule out wired communication. However, based on the briefing and the oral argument, the Court understands uCloudlink's position to be that the extension unit can only communicate wirelessly.

quoted language - which is itself a claim term that uCloudlink has asked this Court to construe - requires wireless communication, it is because that phrase demands it, not the term "extension unit" standing alone.

Additionally, the '689 Patent repeats the language about the extension unit having either a wired or wireless connection to the communication client, but omits the above-quoted language about directly wirelessly communicating with the client. Since the parties agree that "extension unit" has the same meaning in both patents, this supports the conclusion that the extension unit is capable of either wireless or wired communication with the communication client.

uCloudlink further argues that SIMO disclaimed wired connections for the extension unit in the prosecution history. An interview summary from October 6, 2011 states that the applicants agreed to claim amendments "further defining the 'data communication link' and that the extension unit 'directly and wirelessly communicates.'" Cangro Opp. Decl. Exh. 5, ECF No. 45-1. But as SIMO pointed out at oral argument, this interview specifically addressed claim 21, which became claim 1 in the final '735 patent. Tr. Oct. 19, 2018 at 34:20-22. The interview is therefore consistent with this limitation being adopted only for this specific claim. It does not support limiting the phrase "extension unit" wherever it appears.

While the patents provide for either a wired or wireless connection between the extension unit and the communication client, they appear to contemplate only wireless communications between the extension unit and the wireless communication network. See, e.g., '735 Patent at 22:53-55 (extension unit "wirelessly relays" authentication information request to authentication server); id. 22:62-64 (wireless service is "wirelessly requested" by extension unit). At oral argument, SIMO took the position that while claim 1 of the '735 Patent requires wireless connection, claim 8 does not. Tr. Oct. 19, 2018 at 34:3-8. But claim 8 incorporates the method of claim 1 for "establishing a virtual local wireless service," '735 Patent at 24:28-29, which in turns specifies that the extension unit "wirelessly request[s]" service, id. at 23:62-63. Moreover, while there is express support in the patents for a wired connection between the extension unit and the wireless communication client, there is no reference whatsoever to a wired connection with the wireless communication network. The clear implication is that the extension unit only communicates wirelessly with the communication network. However, because this limitation appears in the claims directly, the Court does not believe it necessary to include it in the construction of the phrase "extension unit."

Finally, although SIMO did not challenge this point, the Court does not perceive the need for the word "hardware" to precede "computing device" in uCloudlink's proposed construction.

The Court accordingly construes "extension unit" to mean: "a computing device that is capable of communicating with both a foreign wireless client and a wireless communication network."

3. "said extension unit wirelessly communicating directly with said foreign wireless client"

This term appears in claim 1 of the '735 Patent. SIMO asks that it be given its ordinary meaning. SIMO Br. 21. uCloudlink recommends the following:

the extension unit exchanges information (e.g., data or voice) with the foreign wireless client via wireless connection, without going through a third device or component⁵

uCloudlink Br. 14. The basic dispute is over whether the word "directly" means that the unit must communicate with the client without going through a third device. The Court finds that it does.

As a matter of ordinary usage, the word "direct" suggests that there are no intermediaries between the extension unit and the wireless client. Additionally, Figures 1, 9A, and 9B of the

⁵ uCloudlink's original proposal limited the wireless connection to BLUETOOTH, which SIMO disputed. At oral argument, uCloudlink agreed to drop that limitation. Tr. Oct. 19, 2018 at 61:9-13.

'735 Patent all appear to show the extension unit directly communicating with the wireless client, with no intermediary unit to be seen. SIMO argues that the patent provides for "communications circuitry" to perform the wireless communication, SIMO Br. 22, but uCloudlink correctly notes that the circuitry is part of either the extension unit or the communication client, Def.'s Opp. Claim Const. Br. 18 ("uCloudlink Opp. Br."), ECF No. 44. The communications circuitry is therefore not a separate "device." It is, however, arguably a separate "component." To comport with the specification, that word must be removed from uCloudlink's proposed construction.

Apart from its objection to the "component" language, SIMO offers no reason to think that the extension unit might "directly" communicate by communicating through an intermediary device. Indeed, although SIMO asks this Court to give the phrase its plain and ordinary meaning, SIMO resists the ordinary meaning of the word "directly." SIMO points to another use of the word "directly" in the patents, where "the authentication information is sent directly to the extension unit 108 via the data link," '689 Patent at 19:52-54, so that there is an intermediate step. But even here, the data is sent directly from the administrative system to the extension unit. The data link

is a carrier for the information; it is not a third device that relays the information.

The Court agrees with SIMO, however, that uCloudlink's gloss on "communicating" is unnecessary. The word is easy to understand in context and the parties have not raised any dispute about how it would apply. The Court declines to construe the claim term more extensively than necessary.

Accordingly, the Court construes this phrase to mean: "the extension unit communicates with the foreign wireless client via wireless connection, without going through a third device."

4. "authentication bank"

This term appears in claims 1 and 4 of the '735 Patent and in claims 1, 5, and 7 of the '689 Patent. SIMO proposes "hardware and/or software storing authentication information." SIMO Br. 12. uCloudlink proposes "a storage that contains one or more physical identification modules (e.g. SIM cards), phones, and/or other authentication information." uCloudlink Br. 9. The parties agree that the authentication bank contains authentication information. The dispute is over whether the bank can consist solely of that authentication information, in the form of software (SIMO's position), or whether the bank must instead contain physical items (such as SIM cards or phones) that in turn store the authentication information (uCloudlink's

position). The Court concludes that the authentication bank must include at least some physical objects.

The '735 Patent describes the authentication bank as "contain[ing] one or more[] physical identification modules (e.g., SIM cards) 320a-320n; phones 324a-324n; and/or other authentication information 326." '735 Patent at 9:57-61; see also id. at 22:34-36.⁶ The specification of the '689 Patent includes a similar description. '689 Patent at 10:66-11:2. The claim language of the '689 Patent is slightly different, stating that the bank "compris[es] a plurality of physical identification modules," and defining "physical identification module" to "include[] one or more memory, processors, programs, and computer readable media storing subscriber identity module and authentication information." '689 Patent at 23:49-53. Figure 3B of both patents accords with these descriptions, depicting the bank as containing a number of SIM cards, phones, and other authentication information.

These descriptions make clear that the authentication bank is comprised of both hardware and software. The authentication bank is said to contain physical identification modules, a term

⁶ Many communications systems use SIM cards to store subscriber information, but others store the information on the phones directly, hence the inclusion of both SIM cards and phones in the authentication bank. '735 Patent at 10:10-29, 10:62-67. The catchall "authentication information" is used for other wireless systems, like WiFi. '735 Patent at 10:67-11:2.

most naturally understood to mean hardware. The '689 Patent makes even clearer that the authentication bank includes both hardware components (processors, computer readable media) and software components (memory, program, authentication information).

SIMO protests that the word "physical" does not really mean physical, see SIMO Opp. Br. 4, but it offers scant evidence to support that assertion. First, SIMO argues that "a physical identification module can be software that describes or identifies a physical item." Tr. Oct. 19, 2018 at 46:14-15. But SIMO has offered no evidence that the term is commonly used that way in the field of telecommunications. Moreover, it is counterintuitive. Recall that "SIM" stands for "subscriber identification module." When the patent uses the phrase "physical identification module," the most natural reading is that it is referring to a type of identification module that is physical.

SIMO next argues that the patent provides for "virtual" SIMs when it says that "although SIM cards are described herein, any comparable readable media may [sic] that stores unique subscriber identifying information, such as an IMSI and/or secret key, may be used." '735 Patent at 11:16-19. But "readable media" need not refer to software; it commonly refers to the physical objects in which data are stored. Indeed, that is how

the patents themselves use the term. See, e.g., '735 Patent at 11:64-67 ("Other types of computer-readable media that can store data accessible by a computer may be employed, such a[s] magnetic cassettes, flash memory cards, digital video disks (DVD), Bernoulli cartridges, RAMs, ROMs, smart cards, etc."); '689 Patent at 7:66-8:2 (same). In other words, when the patents speak of "SIM cards," they are referring not only to the traditional card format for storing authentication data but also other formats. But there is no indication that the patents contemplate a purely non-physical format. In fact, the patents state quite explicitly that SIM cards (or their equivalents) "may be received in a physical slot 322a-n, which is sized and dimensioned for receiving SIM cards." '735 Patent at 11:3-5.

Similarly, SIMO argues that the reference to "phones" in the authentication bank could refer to "software phones, like Skype." Tr. Oct. 19, 2018 at 47:7. SIMO pins this claim on the fact that the patented system "can be used for . . . VoIP [Voice Over Internet Protocol]." '689 Patent 5:67-6:3, 17:11. According to SIMO, VoIP refers to "using software to make telephone call," such as Skype or WhatsApp. Tr. Oct. 19, 2018 at 47:18-21. But, again, SIMO has adduced no evidence suggesting that "phone" is a term commonly understood in the field of telecommunications to refer to "software phones." Certainly the patent itself does not readily suggest as much; there is no mention of either VoIP or

software phones in any of the provisions relating to the authentication bank. The patents include "VOIP gateway" in a list of "telephone or computing device[s]," see '735 Patent at 4:45-48, but it is at best ambiguous whether the gateway is considered a "telephone" or a "computing device." Moreover, the way in which the patent refers to "phones" is not easily read to encompass software. The specification states, for example, that "the phones 324 [in the authentication bank] are used for provisioning wireless communication . . . in locations that store authentication data directly on the phone and not on a SIM card, such as is common with CDMA carriers like SPRINT®." '735 Patent at 10:62-67. That description sounds like a physical phone. The Court is therefore not persuaded that "phones," as used in defining the authentication bank, means anything other than physical telephones.

Next, SIMO relies on Figure 1 of both patents. That diagram depicts the authentication bank as a cylinder, a shape it shares with the "subscriber database" and the "routing database." See '735 Patent Fig. 1. In contrast, various servers are represented by rectangles. Id. This, according to SIMO, shows that the authentication bank is a "logical item[]" (i.e. software). Tr. Oct. 19, 2018 at 45:14-46:1. The Court is not persuaded. Nothing in either patent explicitly clarifies that the shape representing a particular component in a particular diagram

determines the form that component takes. At best, SIMO is extrapolating from a very limited set of examples. This supposition cannot overcome the direct language of the patent claims and embodiments.

SIMO also points out that the patents provide that the authentication bank may be "commonly housed" with databases. Tr. Oct. 19, 2018 at 46:2-7; '735 Patent at 6:26-30; '689 Patent at 7:24-28. SIMO argues that it is not possible to "house" hardware with a database. But databases and other forms of software are often housed in some physical casing.

SIMO also urges that the "whole point" of the patents "is to get rid of SIM cards," thus suggesting that it would not make sense to have an authentication bank full of SIM cards. Tr. Oct. 19, 2018 at 50:11. But as uCloudlink points out, part of the point of the patents is to give users an alternative to swapping out SIM cards while traveling, not to eliminate SIM cards altogether.

Finally, SIMO protests that adopting this construction would render certain claim language redundant. That is true to a limited extent; but it does not render the construction inappropriate or inaccurate. The claim language is susceptible to different readings, as the present dispute makes obvious. To resolve that dispute, it is necessary to draw from the language

of the claims and embodiments, even if that results in a certain amount of duplicative wording.

The Court concludes that the authentication bank, as envisioned by the patents, must include at least some physical objects (such as SIM cards or phones) that in turn store authentication information. The Court therefore construes "authentication bank" to mean: "a storage containing one or more physical identification modules (e.g. SIM cards), phones, and/or other authentication information."

5. "data communication link" and "data link"

"Data link" appears in claims 1, 3, and 4 of the '735 Patent. "Data communication link" appears in claim 1 of the '735 Patent and claim 8 of the '689 Patent. At oral argument, uCloudlink agreed to SIMO's construction of both terms, which is "communication link capable of transmitting data." Tr. Oct. 19, 2018 at 52:25-53:4. The Court has therefore adopted that construction.

6. "data channel"

This term appears in claims 1 and 19 of the '689 Patent. As with "data link," uCloudlink has agreed to SIMO's construction, which the Court accordingly adopts: "communication channel capable of transmitting data."⁷

⁷ The parties have not explained what difference, if any, there is between a "communication link" and a "communication channel."

7. "voice link"

This appears in claim 1 of the '735 Patent. SIMO proposes "communication link capable of transmitting voice." SIMO Br. 23. uCloudlink proposes "a connection between a wireless communication device and a provider of a voice/phone network to establish a voice service (e.g., VOIP)." uCloudlink Br. 17. However, uCloudlink agrees that the voice link is "similar" to the data link. uCloudlink Br. 17. The Court therefore finds that SIMO's construction is appropriate, as it parallels the constructions agreed upon by the parties for "data link" and its related terms.

Accordingly, the Court construes "voice link" to mean: "communication link capable of transmitting voice."

8. "the data channel is distinct from local wireless services of the local carrier," "the data communication link is distinct from the local cellular communication network," and "the data channel is not associated with a local wireless service provided to a subscriber of the local carrier"

These terms appear in claims 1, 8, and 19 of the '689 Patent, respectively.⁸ Although the wording varies, the parties agree that each phrase means the same thing. Tr. Oct. 19, 2018 at 53:21-24. SIMO requests that they be given their ordinary meaning. SIMO Br. 19-20. uCloudlink asks that, for each type of

⁸ A materially identical phrase, "the data channel is distinct from wireless services of the local carrier," appears in claim 16 of the '689 Patent, which is not asserted in this suit.

connection, the construction be that the connection "is a connection not using the local cellular communication network." uCloudlink Br. 19-20. The basic dispute is over whether a data channel being "distinct from" or "not associated with" a cellular network also means that the channel is not using that network.

In uCloudlink's telling, the system initially uses the local cellular communication network to, among other things, establish a data link. Then, once that link is established, the system uses that link, rather than the cellular network, to request and send authentication information. Tr. Oct. 19, 2018 at 56:8-11. While uCloudlink's proposal may not be the most natural reading of the terms (one would not normally understand "distinct from" to mean "not using"), it is nonetheless a coherent explanation of what purpose is served by the "distinct from" language. Moreover, it is consistent with the patents. Two of the claims at issue provide that authentication information is sent over the data channel (or data communication link) to the wireless client, which then sends the authentication information to the local carrier over "signal link of the local cellular communication network." '689 Patent at 24:8-21, 28:11-20; see also id. at 25:27-37. This strongly suggests that two entirely separate and discrete information channels are used: the data channel on the one hand, and the "signal link of the

local cellular communication network" on the other. uCloudlink's construction comports with that understanding.

Moreover, when the Court asked SIMO's counsel at oral argument what possible applications might be foreclosed by uCloudlink's construction, counsel had no answer. Tr. Oct. 19, 2018 at 57:3-12. SIMO's opposition to this construction appears to be based not on a substantive disagreement about the scope of the claim term, but rather on a vague sense that uCloudlink's construction might confuse the jury.

The Court is unable to accept SIMO's proposal that these phrases not be further construed. There is a genuine dispute between the parties about whether the data channel may use the local cellular communication network. Simply telling the jury to apply the ordinary meaning would not resolve this question. Indeed, the Court doubts whether a lay jury would even intuitively understand that (as the parties agree) "distinct from" and "not associated with" have the same meaning. It is the Court's obligation to resolve this question about the scope of the patent claims in order to provide guidance to the jury. The Court is satisfied that uCloudlink's construction provides such guidance. To the extent that there is some residual ambiguity about what it means to "not use" a cellular communication network, "a sound claim construction need not always purge every

shred of ambiguity." Acumed LLC v. Stryker Corp., 483 F.3d 800, 806 (Fed. Cir. 2007).

Accordingly, the Court has adopted the following constructions:

"The data channel is distinct from local wireless services of the local carrier" means "the data channel is not using the local cellular communication network."

"The data communication link is distinct from the local cellular communication network" means "the data communication link is not using the local cellular communication network."

"The data channel is not associated with a local wireless service provided to a subscriber of the local carrier" means "the data channel is not using the local cellular communication network."

9. "foreign wireless client" and "foreign wireless communication client"

"Foreign wireless client" appears in claims 1-3, 9, and 13 of the '735 Patent. "Foreign wireless communication client" appears in claims 1, 5, 7, 8, 14, and 19 of the '689 Patent. The parties agree that the terms should be construed identically. SIMO suggests "wireless communication client that is not in contract with a local cellular network." SIMO Br. 20. uCloudlink suggests "a telephone or hardware computing device that is capable of communicating wirelessly, and is not subscribed to a

local cellular network for a current location of the phone or device." uCloudlink Br. 15, 21.

SIMO disputes the phrase "telephone or hardware computing device that is capable of communicating wirelessly," but uCloudlink correctly notes that this phrase is lifted almost verbatim from the specification. See '735 Patent at 4:44-46 ("The wireless communication client 106 may be any telephone or computing device capable of communicating wirelessly"). SIMO does not identify what is wrong with this definition or how it improperly limits the patent. And while SIMO claims that the term "wireless communication client" is one of common use in the field, it offers no support for that proposition. However, SIMO is correct that uCloudlink has inserted "hardware" where that word does not appear in the patent. SIMO Opp. Br. 8. The Court sees no reason to include this word in the construction.

The second part of uCloudlink's construction is also drawn directly from a definition in the patent itself. See '735 Patent at 5:61-64 ("By 'foreign' it is meant that the wireless communication client 106 (or its SIM card) is not subscribed to the wireless communications network."). SIMO does not raise any objection to this part of uCloudlink's construction. SIMO's own construction is clearly inferior, as the word it uses - "contract" - has no basis in the patent. When the specification

explicitly defines a word, as here, that definition is conclusive. See Phillips, 415 F.3d at 1316.

Finally, the last part of uCloudlink's construction - "for a current location of the phone or device" - specifies the referent for the word "local." If a user has a phone plan in New York, and that user travels to France, the user is subscribed to a "local" cellular network relative to New York, but not to France. This phrase clarifies that it is the phone's current location that determines whether the phone is subscribed to a "local" network. However, the article "a" should be replaced with "the" for clarity.

Thus, the Court construes both "foreign wireless client" and "foreign wireless communication client" to mean: "a telephone or computing device that is capable of communicating wirelessly and is not subscribed to a local cellular network for the current location of the phone or device."

10. "communication server"

This term appears in claim 1 of the '735 Patent. SIMO requests that it be given its ordinary meaning. SIMO Br. 22. uCloudlink suggests "a computing device facilitating the rerouting of a non-local call to a destination device, using the most suitable route to avoid roaming cost." uCloudlink Br. 15.

It is undisputed that rerouting calls efficiently is at least part of what the communication server does. See SIMO Opp.

Br. 9 ("rerouting calls is a, but not the, job of the communication server"). But SIMO has not explained what else, if anything, the communication server does; it insists simply that it is a "server performing communication." SIMO Br. 22. As uCloudlink points out, however, the patent references several servers, all of which communicate in some way. uCloudlink Opp. Br. 19. The construction must somehow distinguish the communication server, and uCloudlink's proposal appears to accurately describe what the server does. See '735 Patent at 12:22-25 (stating that the communication server includes software "for receiving calls, determining the most efficient or suitable route for the call, and thereafter routing the call").

However, SIMO is correct that the use of the term "a computing device" suggests a single, discrete item, while the patent explicitly leaves open the possibility that the "server" might in fact be spread across multiple servers. See '689 Patent at 23:40-42 ("[S]ome items shown separately in the Figures could be implemented on single servers and single items could be implemented by one or more servers."); '735 Patent at 22:6-9 (same). Using the word "server," which itself should not require any explanation, avoids this problem. Additionally, the word "routing" is preferable to "rerouting." Although the patent seems to use both interchangeably, "routing" avoids any

implication that the communication server only functions if a call has already been routed by something else.

SIMO also correctly points out that the communication server is capable of routing calls not only directly to a destination device, but also to another communication server. See '735 Patent at 14:49-52. The Court does not believe that uCloudlink's construction precludes this operation; if a communication server routes a call to a second communication server, which in turn routes the call to a destination device, the first server still "facilitat[ed]" the routing of the call to its ultimate destination. Nonetheless, the Court does not consider the "to a destination device" language to be necessary, and omitting it improves the clarity of the construction.

Finally, SIMO argues that the language "using the most suitable route to avoid roaming cost" is ambiguous. Tr. Oct. 19, 2018 at 64:15-19. The Court agrees. It is true that the specifications describe the server using the "most suitable route," and that doing so reduces costs. See, e.g., '735 Patent at 14:47-53. But it is not clear to the Court that cost is the only measurement for the "most suitable" route. As SIMO notes, considerations other than cost might influence the choice of routing. The patents do not foreclose the possibility that the communication server might, for example, choose the second-

cheapest route if it were more secure or faster than the cheapest route.

Accordingly, the Court construes "communication server" to mean: "a server facilitating the routing of a non-local call."

11. "command link" and "signal link"

"Command link" appears in claims 3 and 4 of the '735 Patent. "Signal link" appears in claims 1, 8, 13, and 19 of the '689 Patent. SIMO proposes that the construction be "communication link capable of transmitting" commands or signals, respectively. SIMO Br. 23. uCloudlink proposes the following construction for both: "a connection between a wireless communication device and a service provider of a cellular network to transmit a service request and authentication information before the service is provided." uCloudlink Br. 17, 22.

SIMO argues that uCloudlink is importing limitations from the specifications into the claims, but SIMO does not explain what functions of the command and signal links are omitted by uCloudlink's construction. SIMO's own definitions make little sense. The command link, for example, is used to request a data link, request authentication information, and send authentication information. '735 Patent at 23:37-47. Those functions do not involve sending a "command." Moreover, defining the signal link as a link that can transmit signals communicates

virtually no information. The so-called "commands" transmitted by the command link, after all, are also signals. SIMO uses different terms to construe the command and signal links, yet defines "signal link" in a way that confusingly seems to include the command link. Far from providing clarity, this is likely to confuse the jury.

The Court agrees with uCloudlink that the patents appear to use "signal link" and "command link" in the same way and therefore they should have the same construction. See '735 Patent at 23:37-47; '689 Patent at 25:32-37, 26:4-6.

uCloudlink's construction accurately describes what information is sent over these links, and therefore the Court mostly adopts its construction.

However, SIMO raises two valid objections. First, uCloudlink's construction only lists service requests and authentication information, but the command and signal links are also used to send the request for authentication information. Second, uCloudlink's temporal limitation ("before the service is provided") is unnecessary. Since the claim terms relate to a request for service, it is true that the requests will happen before service is provided, but it is redundant to include that in the construction itself.

Accordingly, the Court construes both command link and signal link to mean: "a communication link over which a wireless

communication device requests service from a service provider of a cellular network, and over which authentication information and requests for authentication information are exchanged."

12. "authentication information" and "local authentication information"

These terms appear in claims 1, 3, 4, and 8 of the '735 Patent and in claims 1, 5, 7, 8, 10, 14, and 19 of the '689 Patent. The parties agree that there is no meaningful distinction between the terms. SIMO proposes defining each term as "information needed to perform (local) authentication." SIMO Br. 9. uCloudlink proposes "information for confirming whether a SIM is verified in order to receive a cellular communication service." uCloudlink Br. 12-13.

SIMO complains that "authentication" is "so commonly used in the telecommunications field that no construction is needed," but provides no evidence supporting this assertion apart from the fact that the word "authentication" appears in the "Background" section of the '689 Patent. SIMO Br. 10. In any event, uCloudlink's construction accurately captures the process of authentication as that word is used in the patents - i.e. verifying that the device is entitled to receive cellular service.

SIMO insists that this construction would render claim 19 of the '689 Patent - which says that the authentication

information is sent to the carrier "to provision a communication service from the local carrier for the mobile telecommunications device," '689 Patent at 28:18-20 - superfluous. The Court disagrees. uCloudlink's construction explains that the authentication information is information used to verify a device to receive cellular service; claim 19 describes the process by which the information is, in fact, used for that purpose. Claim 19 therefore still serves a function under uCloudlink's construction.

SIMO also objects that the claim does not limit authentication information to information that is used to receive a cellular communication. SIMO Br. 10. But SIMO has not identified, and the Court is unable to discern, any other use for the authentication information as described by the patents. E.g., '689 Patent at 20:61-66 ("The authentication information is then transmitted to the service provider by the client 106 at 948. The service provider 110 then authenticates the wireless communication client 106 as a local wireless communication client, at 950, and provides the requested service to the wireless communication client 106 at 952.")

SIMO correctly notes, however, that authentication information is not limited to SIM cards. The patents repeatedly refer to authentication information in addition to SIM cards. See, e.g., '735 Patent at 22:34-35 (referring to "subscriber

identity modules (SIMs), phones and authentication data"); '689 Patent at 25:6-8 (referring to "authentication data stored on a [SIM] card and/or in memory"). It may be that the usual method of authentication will come from a SIM card. See, e.g., '689 Patent at 23:57-61 (describing the process of "receiving a first request for authentication information . . . for associating a [SIM] with a foreign wireless communication client or an extension unit"); id. at 24:5-7 (describing "retrieving subscriber identity information and authentication information for the foreign wireless communication client or the extension unit from the SIM"). But "authentication information" need not be stored on a SIM. In fact, not all networks use SIM cards, see '735 Patent at 10:27-30, and the authentication bank, as discussed above, provides for storage of authentication information on media other than SIM cards.⁹ The construction must therefore be modified to clarify that devices other than SIM cards can be authenticated.

Accordingly, the Court construes both "authentication information" and "local authentication information" to mean:

⁹ uCloudlink cites to a passage describing the authentication of SIM cards in support of its position that authentication refers only to verifying the SIM itself. uCloudlink Opp. Br. 8-9. But uCloudlink conspicuously omits the sentence immediately preceding the quoted portion, which makes clear that the quoted material describes only "networks using SIM cards." '735 Patent 10:39 (emphasis added).

"information for confirming whether a device is verified to receive a cellular communication service."

13. "re-authenticate" and "re-authentication"

These terms appear in claim 14 of the '735 Patent and claim 10 of the '689 Patent. SIMO argues that these terms are obvious and need no construction. SIMO Br. 11. uCloudlink suggests "periodically confirm whether a SIM is verified in order to continue to provide a cellular communication service." uCloudlink CC Br. 18, 23.

The Court agrees with SIMO that the prefix "re" has an obvious meaning that needs no further explanation. Additionally, uCloudlink's insertion of the word "periodically" may imply a fixed timetable, contrary to the specification. See '689 Patent at 21:7-8 (noting that client "may need to re-authenticate" "[e]very so often"). Since uCloudlink agrees that it is "not attempting to require a set period between verification requests," uCloudlink Opp. Br. 10, that word must be removed. Other than that, however, uCloudlink's construction is appropriate, as it substantially mirrors the construction given to authentication information, above.

The Court accordingly construes both "re-authenticate" and "re-authentication" to mean: "re-confirming that a device is verified to receive a cellular communication service."

14. "storing the local authentication information"

This phrase appears in claim 10 of the '689 Patent. SIMO asks that the term be given its ordinary meaning. SIMO Br. 14. uCloudlink proposes the following: "placing the local authentication information on a SIM card or in memory of the wireless communication client or extension unit for preservation or later use." uCloudlink Br. 20.¹⁰ There are two disputes: (1) whether the claims are properly limited to storage on a SIM card or in memory; and (2) whether the storage must be for "later use" (which would exclude storage on short-term memory).¹¹

As to the first dispute, every example given of storage involves storing the information on a SIM card or in memory of the client or extension unit. E.g. '689 Patent at 14:23-25, 17:19-21. SIMO has not suggested any alternative method of storage that the patents might encompass. Rather, SIMO relies on the following language to argue that the storage methods could be broader: "In some embodiments, the wireless communication client 106 (or wireless extension unit 108) stores at least a

¹⁰ uCloudlink's brief says that the information must be stored for "preservation and later use." uCloudlink Br. 20 (emphasis added). The parties' joint claim construction statement, however, used "or." Joint Disputed Claim Terms Chart 8, ECF No. 32. The Court assumes the construction in the brief is a typographical error. In any event, "or" is the more appropriate article.

¹¹ Short-term or "volatile" memory, such as RAM, erases its data when the device is powered down. Weldon Decl. Exh. C at 474, ECF No. 37-4 (definition of "volatile memory").

portion of the incoming authentication data either on a SIM card and/or in memory 512 as authentication information 532." '689 Patent at 16:61-64. In context, however, this appears to be saying that only some embodiments store the authentication information at all; it does not suggest that, if the information is stored, it would be placed anywhere but on a SIM card or in memory. Cf. '689 Patent at 23:5-12 (noting that authentication data "may not be stored at the wireless communications system" either because of "the nature of authentication data" or because wireless communications system "has limited and/or insecure memory").

As to the second dispute, uCloudlink is correct that the patent claim specifies that the information is stored so that it can be retrieved later. See '689 Patent at 25:52-55 (describing the process of "relaying the stored local authentication information to the local cellular communication network when the local cellular communication network attempts to re-authenticate the local authentication information"). This excludes the possibility that the "storage" could be in short-term memory. SIMO protests that this construction will render the claim redundant. SIMO Opp. Br. 5-6. Not so. The fact that the data is stored so that it can later be used for re-authentication provides guidance as to what is meant by "storing." "Storing" the data in volatile memory would not serve this purpose, since

the data would likely not remain stored long enough to actually be used to re-authenticate. Accordingly, it can be inferred that the "storage" in this claim term refers only to stable, long-term memory. It is not redundant to note that in the construction.

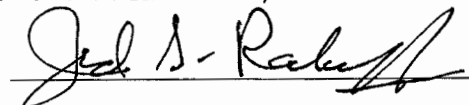
In any event, uCloudlink's construction also leaves open the possibility that the data could be stored for "preservation." As a matter of common sense, if data is stored, it is stored either to be preserved or to be later used. SIMO, again, has not identified any purpose for which data might be stored that is not described by this construction.

Accordingly, the Court construes this term to mean: "placing the local authentication information on a SIM card or in memory of the wireless communication client or extension unit for preservation or later use."

For the foregoing reasons, the Court adopted the constructions set forth in its Order dated November 1, 2018.

Dated: New York, NY

November 9, 2018

A handwritten signature in black ink, appearing to read "Jed S. Rakoff", written over a horizontal line.

JED S. RAKOFF, U.S.D.J.